CR Minimum Cable Assembly and Channel Insertion Loss

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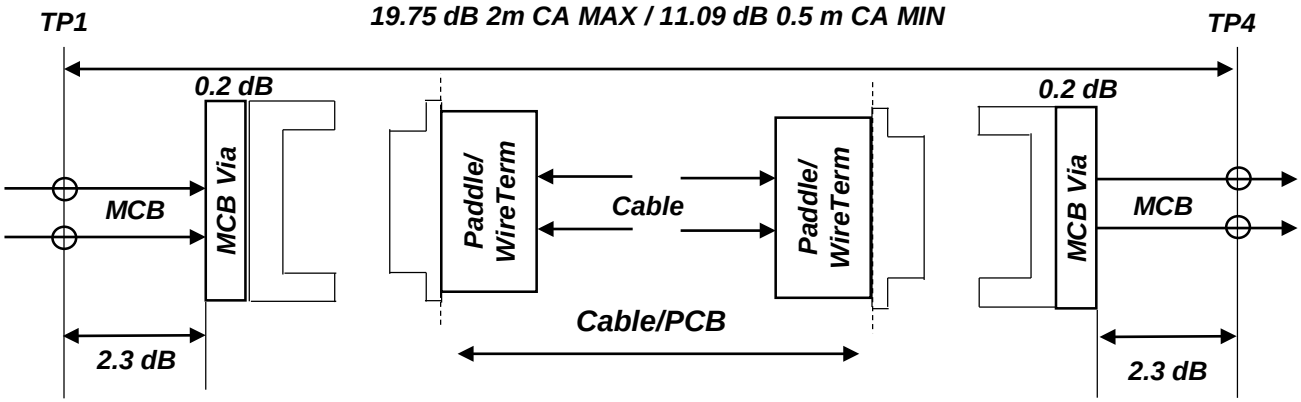
Purpose

- **CR Minimum Cable Assembly and Channel Insertion Loss**
- **Figure 162A–1—Cable assembly, host, and test fixture insertion loss at 26.56 GHz baseline corrections**

Cable Assembly Minimum IL

- D1.0 Specifications



dB @ 26.56 GHz

MAX Cable and PCB	11.55 = 19.75-(2*2.3+2*1.6+2*0.2)
CA MAX (TP1-TP4)	19.75 = 11.55+2*2.3+2*1.6+2*0.2
CA MIN (TP1-TP4)	11.0875 =0.25*11.55+2*2.3+2*1.6+2*0.2
MIN Cable and PCB	2.8875=0.25*11.55

- Discussion
  - Min Cable/PCB calculation for 802.3cd assumed error in linear scaling for cable and PCBs
  - To correct should be (11.55-PCBs)*0.25 – need to agree on PCB (paddle/wire termination) to linearly scale cable)

Cable Assembly Minimum IL

- Specify PCB IL and Cable IL (dB/m) to enable same PCB IL and cable IL (dB/m) to be used for max and min cable assembly
  - Max Cable Assembly IL = 2*PCB IL + Cable IL (2m)
  - Min Cable Assembly IL = 2*PCB IL + Cable/4 (0.5 m)
- Example only:
  - PCB = 1.3 dB
  - Cable = 4.475 dB/m
- Max cable assembly = 19.75 dB =(11.55)+2*2.3+2*1.6+2*0.2
- Min cable assembly = ~13 dB =(~4.8)+2*2.3+2*1.6+2*0.2
- Channel with min IL cable assembly 21.75 =13+2*10.975-2*6.6

The channel insertion loss associated with the 0.5 m cable assembly and a maximum host channel is determined by Equation (162A–2).

$$IL_{Ch0.5m}(f) = IL_{Camin}(f) + 2IL_{Host}(f) - 2IL_{MatedTF}(f) \quad (162A–2)$$

for $0.05 \le f \le 40$

where

$IL_{Ch0.5m}(f)$	is the channel insertion loss in dB between TP0 and TP5 representative of a 0.5 m cable assembly and a maximum host channel
$IL_{Camin}(f)$	is the minimum cable assembly insertion loss in dB (TP1 to TP4) given in TBD and illustrated in TBD
$IL_{Host}(f)$	is the maximum insertion loss in dB from TP0 to TP2 or TP3 to TP5 using TBD
$IL_{MatedTF}(f)$	is the reference insertion loss in dB of the mated test fixture using Equation (162B–1)
f	is the frequency in GHz

Cable Assembly Minimum IL

Use ILchmin and ILcamin versus ILch0.5m and ILca0.5

$$IL_{Chmax}(f) = IL_{Camax}(f) + 2IL_{Host}(f) - 2IL_{MatedTF}(f) \quad (162A\text{–}1)$$

for $0.05 \le f \le 40$

where

$IL_{Chmax}(f)$	is the maximum channel insertion loss in dB between TP0 and TP5
$IL_{Camax}(f)$	is the maximum cable assembly insertion loss in dB (TP1 to TP4)
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Cable Assembly Minimum IL

What goes in the standard:

- Adopt Min cable assembly = 13 dB @ 26.56 GHz

Table 162–13—Cable assembly characteristics summary

Description	Reference	Value	Unit
Maximum insertion loss at 26.56 GHz	162.11.2	19.75	dB
Minimum insertion loss at 26.56 GHz	162.11.2	11.09	dB
Minimum cable assembly ERL[a]	162.11.3	TBD	dB
Differential to common-mode return loss	162.11.4	TBD	dB
Differential to common-mode conversion loss	162.11.5	TBD	dB
Common-mode to common-mode return loss	162.11.6	TBD	dB
Minimum COM	162.11.7	3	dB

[a]Cable assemblies with a COM greater than 4 dB are not required to meet minimum ERL.

13 dB

- Use ILchmin and ILcamin versus ILch0.5m and ILca0.5 and values

Table 162A–1—Insertion loss budget values at 26.56 GHz

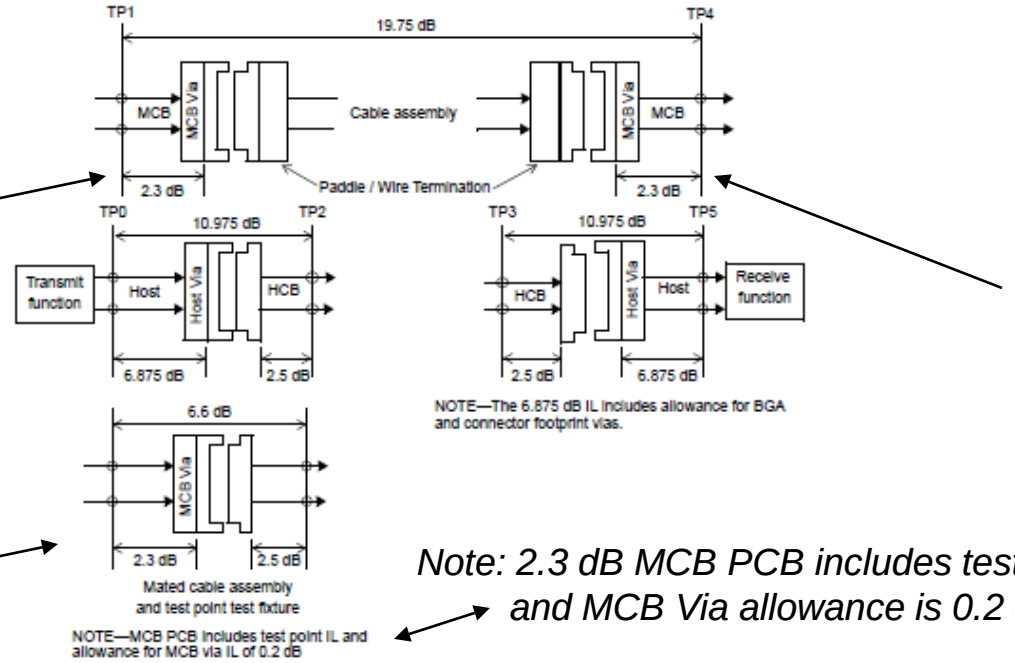
Parameter	Value	Units
IL_{Chmax}	28.5	dB
IL_{Camax}	19.75	dB
$IL_{Ch0.5m}$	19.84	dB
IL_{Camin}	11.09	dB
IL_{Host}	10.975	dB
$IL_{MatedTF}$	6.6	dB

21.75

13 dB

IEEE Draft P802.3ck/D1.0

- Move arrows and align text per adopted baseline



Note: 2.3 dB MCB PCB includes test point IL and MCB Via allowance is 0.2 dB

Figure 162A–1—Cable assembly, host, and test fixture insertion loss at 26.56 GHz

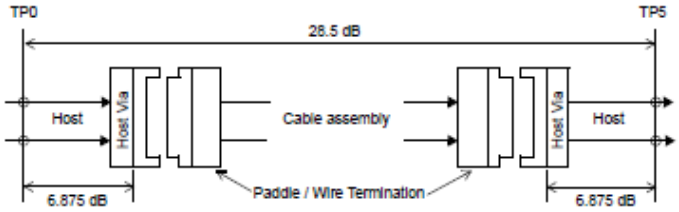
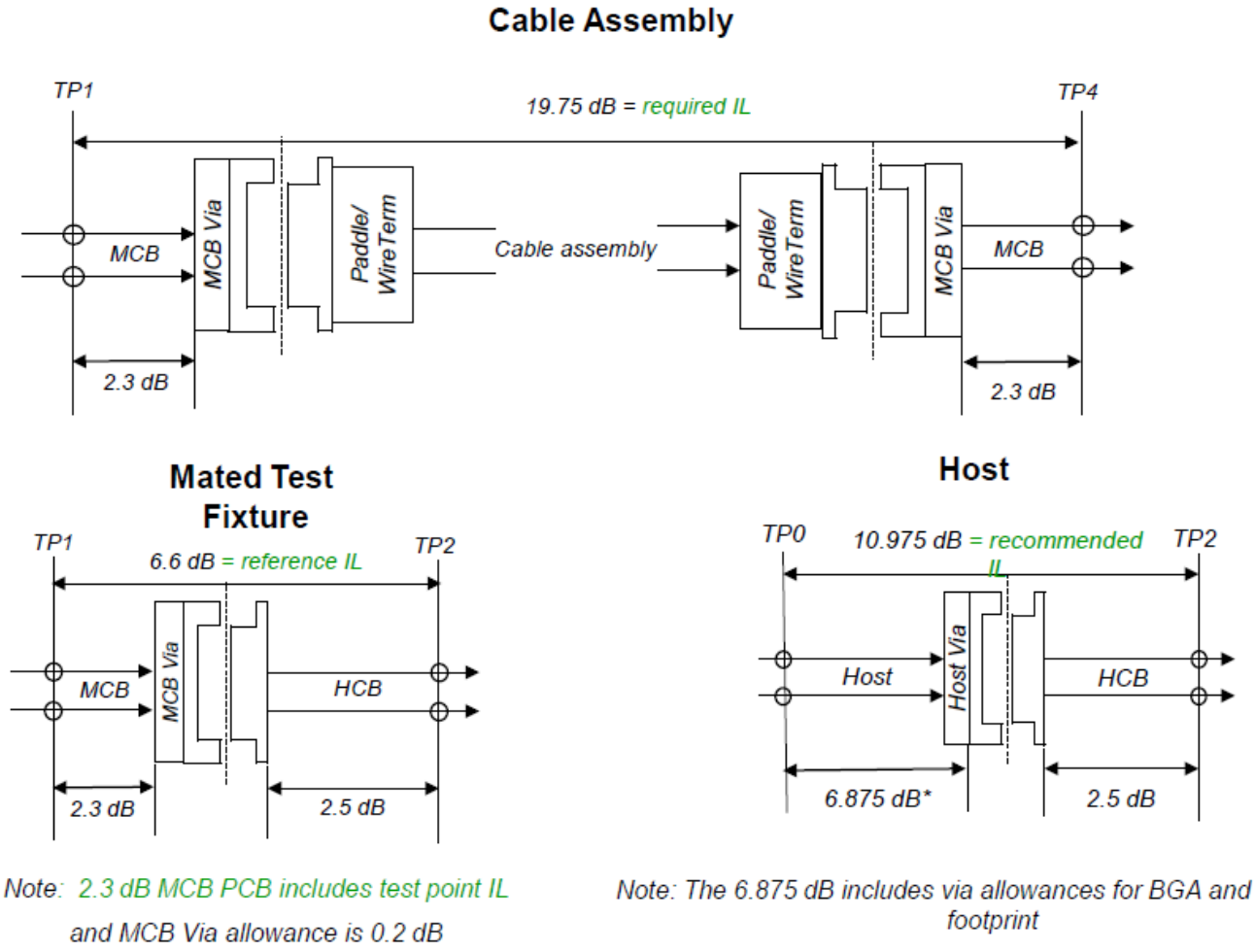


Figure 162A–2—Channel insertion loss at 26.56 GHz

Adopted baseline - diminico_3ck_01_1119.pdf

802.3ck Figure XX–1—28.5 dB channel insertion loss budget at 26.56 GHz



Note: 2.3 dB MCB PCB includes test point IL and MCB Via allowance is 0.2 dB

Note: The 6.875 dB includes via allowances for BGA and connector footprint